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## INCENTIVIZING PUBLISHERS TO JOIN A PUBLISHER NETWORK

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## INCENTIVIZING PUBLISHERS TO JOIN A PUBLISHER NETWORK

In a networked environment, such as the Internet or other networks, first-party content providers (e.g., publishers) can provide information for public presentation on resources, for example webpages, documents, applications, and other resources. The first-party content can include text, video, and/or audio information provided by the first-party content providers via, for example, a resource server for presentation on a client device over the Internet. The first-party content may be a webpage requested by the client device, a stand-alone application (e.g., a video game, a chat program, etc.) running on the client device, or otherwise. Additional third-party content can also be provided by third-party content providers for presentation on the client device together with the first-party content. For example, the third-party content may be a public service announcement or advertisement that appears in conjunction with a requested resource, such as a webpage (e.g., a search result webpage from a search engine, a webpage that includes an online article, a webpage of a social networking service, etc.) or with an application (e.g., an advertisement within a game). In some instances, the third-party content may be mobile advertisements (e.g., advertisements for display on a mobile application of a user device).

A publisher may join an advertising platform. The advertising platform provides third-party content (e.g., advertisements) for display on the resources (e.g., webpages) of the publisher. One example of an advertising platform is a mobile application advertising platform configured to provide advertisements for display on a mobile application on a client device. The publishers are provided revenue as advertisements are provided from the advertising platform for display on the publisher's resource.

A publisher may consider several factors when deciding whether to join an advertising platform. For example, the publishers may take into consideration how much revenue they will generate per query (e.g., every time a user inputs a query on a client device and accesses a resource of the publisher). However, the publishers may further consider what particular features the advertising platform offers. Features may include, for example, in-house reservation optimization, user engagement analytics, and cross-device user

analytics, among others, all of which can affect the quality of a publisher's experience with the advertisement platform.

Publishers may opt not to join a particular advertisement platform if a certain feature that is important to them is not available. This may make it difficult on the advertisement platform. On the one hand, publishers may not join an advertisement platform if a certain feature is not available, but on the other hand, it may be too cost-ineffective to develop a new feature just to get a few new publishers to join the advertisement platform. However, if the advertisement platform knew that many publishers would like the feature, then it would be cost-effective to develop the feature. It is difficult to know which features are in high demand because it is not feasible for sales representatives to talk to more than a very small fraction of the various publishers that may be interested in the advertisement platform.

This paper discusses an automated system in which publishers would be able to tell the advertisement platform which features they would value having and how much these features are worth to them. The advertisement platform can decide which features to develop as well as which publishers to invite to join the advertisement platform. The advertisement platform uses the information about how the publishers value certain features to find publishers who value the same features, before the advertisement platform develops the features. The advertisement platform may invite the publishers who value the same features to join the system, and may make temporary payments to the publishers while the features are developed. This provides an incentive for publishers to reveal their true values for particular features. This automated system is mutually beneficial to the advertisement platform (to get more publishers to sign up, and to make an optimal decision about which new features to develop) and to the publishers (to sign up for a platform with features they desire).

The automated system includes an auction mechanism in which publishers can express their preferences over how much they value certain features and combinations of features. Once the automated system has this information, the automated system decides on a particular set of features to develop and a particular percentage of revenues to offer publishers to join the advertisement platform while the features are being developed. In some implementations, only publishers willing to accept less than this percentage will join the advertisement platform.

Referring to the Figure, a flow chart of a process for implementing the automated system is shown. First, publishers are allowed to make bids for features and the advertisement platform receives the bids. A bid for a particular feature or combination of features may indicate a minimum percentage of additional revenue the publisher is willing to accept as payment in order to join the advertising platform if the feature or features are developed. Publishers may make bids for as many different features or combinations of features as they would like. In doing this, publishers can make a bid that gives the percentage of revenues they are willing to accept for some minimum feature set that the publisher is willing to accept. In some implementations, publishers can also make bids expressing preferences over other combinations of features. For instance, a publisher might enter a bid that indicates it would need to obtain a relatively large payment from the advertisement platform in order to join the platform if the platform only develops particular features that the publisher views as absolutely essential. However, the same publisher may also say it is willing to accept a smaller payment from the advertisement platform if the platform also develops other features that are less essential but preferred by the publisher. In other words, the publishers indicate how much revenue they are willing to accept from the platform in exchange for particular features (i.e., accepting less revenue if additional features are provided to them).

Once the advertisement platform receives bids from many publishers, it decides on a particular combination of features to develop, as well as a percentage of revenues to offer publishers to join the platform while they are in the process of developing the features. The features are chosen in order to maximize the welfare of the advertisement platform.

The calculation to determine which features to develop and what percentage of revenue to offer the publishers is now described. For any fixed combination of features, the advertisement platform calculates the percentage that would maximize the economic welfare of the platform. This may take into account the value of bringing on publishers who are willing to accept less than this percentage to join the platform as the features are developed as well as the cost of paying this percentage to each publisher. In general, setting a higher percentage will have the benefit of attracting a larger number of publishers to join the advertisement platform, but has the cost of having to pay a larger amount to the publishers

who end up joining the advertisement platform. The percentage can be set in such a way that the marginal economic benefits of attracting a larger number of publishers through a slightly larger percentage roughly balances with the marginal economic cost of having to pay the larger amount to publishers who do join the system.

Once a percentage of revenues is determined for each combination of features, the advertisement platform determines which combination of features should be chosen to result in the largest economic benefit of the platform. This takes into account the cost of developing the features, the percentage of revenues that will be paid back to the publishers, and the particular publishers that will be brought into the platform if the features are developed.

A particular combination of features and percentage of revenues are chosen. If a publisher makes a bid for some subset of the chosen features that the platform decided to develop, and the bid is for a lower percentage of revenues than the chosen percentage of revenues, then that publisher is invited to join the advertisement platform. Otherwise, the publisher is not invited to join the advertisement platform.

The automated system allows for an auction mechanism that enables bidders (e.g., publishers) to express how much they value any particular combination of goods (i.e., combination of features). In some implementations, this information is aggregated by deciding on a single combination of goods (i.e., a single set of features) that will be developed and a single price (i.e., a single percentage of seller revenues) at which the features will be sold. Only bidders willing to accept a subset of the developed features at less than the single price being offered are invited to join the system.

The following is an example implementation of the automated system and process above. A publisher makes two bids indicating they will join the advertisement platform if: (1) the platform develops in-house reservation optimizations, and agrees to pay the publisher an additional 15% while the feature is developed, or (2) the platform develops both in-house reservation optimizations and user engagement analytics, and agrees to pay the publisher an additional 12% while the features are developed. Whether the publisher is invited will then depend on which features the platform decides to develop and the percentage of publisher

revenues that the platform decides to offer publishes while the features are being developed. This is largely based on bids made by other publishers.

If the advertisement platform decides to develop in-house reservation optimizations, and offers 20% of publisher revenues while the feature is developed, then the publisher is invited to join the advertisement platform and is paid an additional 20% of its revenues while the feature is developed. If the advertisement platform decides to develop in-house reservation optimizations, and offers 13% of publisher revenues while the feature is developed, then the publisher is not invited to join the advertisement platform. If the advertisement platform decides to develop in-house reservation optimizations and user engagement analytics, and offers 13% of publisher revenues while the features are developed, then the publisher is invited to join the advertisement platform and is paid an additional 13% of its revenues while the features are developed. If the advertisement platform decides to develop an IAP optimization engine (e.g., a feature not specified by the publisher), then the publisher is not invited to join the advertisement platform since the publisher indicated they were only willing to join if other features (i.e., in-house reservation optimizations) are implemented.

One advantage of the automated system and process described above is that the best strategy for the publisher is to truthfully tell the advertisement platform what percentage of the revenues they would need to receive in order for the publisher to join if a certain combination of features is developed. If a large number of publishers participate in the process, then any one publisher's bid will have a small or negligible effect on the final percentages offered by the advertisement platform. Since the percentage is roughly fixed, a publisher wants to ensure that it is able to join the advertisement platform if and only if the publisher is willing to accept less than the percentage of revenues offered. The publishers can ensure this by truthfully revealing what percentage of revenues they need, so truthful revelation is the best strategy for the publisher to follow.

For the advertisement platform, since the platform is choosing which features to develop and the percentage of revenues to offer publishers in such a way to maximize its economic welfare, the best possible economic outcome for the advertisement platform is

ensured. The advertisement platform would be able to express the final outcome of the auction (i.e., the chosen features and percentage of revenues) in a transparent and simple way.

The strategies for publishers in the auction mechanism are fairly simple. The publisher only needs to specify which particular features the advertisement platform needs to develop, as well as the percentage of revenues they would need to be offered in the meantime for them to join the advertisement platform while the features are developed. The publishers would not have to do any significant strategic planning beyond figuring out which features they want. The publishers would have the flexibility to reveal their values for a wide range of possible combination of features. In particular, this would allow publishers to effectively label some features as required if they are to join the platform, and other features as nice to have but less essential.

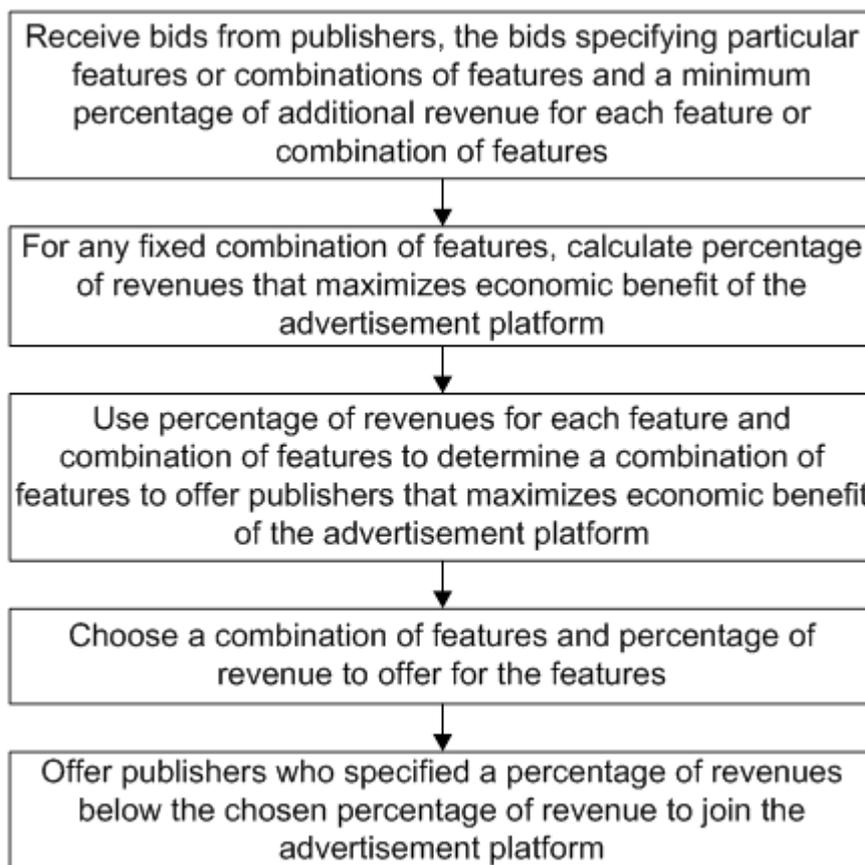


Figure 1. A flow chart of a process for selecting a combination of features to develop for an advertisement platform, and a percentage of revenues to offer publishers for developing the features, and for inviting publishers to join the advertisement platform.